REMARKS

The present application is directed to an antibody or a fragment thereof that recognizes a mammalian GBS toxin receptor. The application is also directed to compositions comprising the antibody. Prior to this Response, Claims 82, 83, 85-89, 97-100, and 102-105 were pending. In this Response, applicants cancel Claims 83, 98 and 100 and request entry of the amendments to Claims 82, 87, 89, 97, 99, 102 and 104 ("present amendments"). The amendments do not add any new matter and present the claims rejected by the Examiner in better form for consideration on appeal as provided in 37 C.F.R. §1.116. Upon entry of the present amendments, Claims 82, 85-89, 97, 99 and 102-105 will be pending.

Telephone Interview

Applicants thank the Examiner for the courtesy of the telephone interview on March 29, 2006, where applicants' undersigned agent and the Examiner discussed the claim rejections under 35 U.S.C. §112 and proposed amendments to claims to overcome these rejections.

Claim Rejections under 35 U.S.C. §112, First Paragraph - Enablement

The Examiner rejects Claims 82, 83, 85-89, 97-100, and 102-105 under 35 U.S.C. §112, first paragraph, on the basis that the specification does not provide sufficient enablement for the claims. Applicants cancel Claims 83, 98 and 100, rendering their rejection moot. Applicants respectfully submit that the amendments to Claims 82, 87, 89, 97, 99, 102 and 104 overcome the rejection.

The Amendments Overcome the Rejection for Reasons of Insufficient Enablement

The Examiner asserts that the previously presented claims are overly broad because they recite antibodies recognizing fragments of a GBS toxin receptor that are smaller in size than the polypeptide of SEQ ID NO:8, because such fragments can include a single amino acid, and because the claims do not limit the fragment to an immunogenic fragment. *See Final*

Office Action, page 3, second paragraph, and page 5, first paragraph. The present amendments delete the references to fragments of the GBS toxin receptor from Claims 82, 89, 97, 99, 102 and 104. The claims as currently amended are directed to an antibody that recognizes a GBS toxin receptor. Applicants assert that the amendments overcome the rejection under 35 U.S.C. §112, first paragraph.

Product-by-Process Claim 87 is Enabled

Applicants amended dependent product-by-process Claim 87 to recite the isolated antibody or the fragment thereof generated by a method comprising immunizing an animal with the mammalian GBS toxin receptor or an immunogenic polypeptide fragment thereof having at least six amino acids. Support for the amendment is found throughout the specification. For example, on page 8, lines 23-32, the term "polypeptide fragment" is defined as encompassing fragments 5-10 amino acids long. The term "immunogenic" is provided in the specification on page 17, line 8, and is described as including GBS fragments having at least six amino acids in length on page 17, line 7. Applicants respectfully submit that Claim 87 is enabled by the application, as filed.

The application, as filed, enables one of ordinary skill in the art in the field of the present application to immunize an animal with immunogenic polypeptide fragment of GBS toxin receptor having at least six amino acids in order to generate the claimed antibodies. On page 25, in Table 7, the specification discloses how to identify immunogenic GBS toxin receptor fragments, and teaches three immunogenic GBS toxin receptor fragments, each six amino acids in length. These three fragments are used to design peptide antigens, as described in working Example 3, beginning on page 44 of the specification, and to prepare anti-GBS toxin receptor antibodies.

Claim 97 is Enabled

The Examiner also asserts that it would require undue experimentation for one of ordinary skill in the art in the area of the claimed invention to make and use compositions recited

in Claim 97 because the claim does not recite structural or functional limitations for a reagent for detection of GBS toxin receptor. See *Final Office Action*, page 5, second paragraph.

Upon entry of the present amendments, Claim 97 and its dependent claims will specify that the reagent for detection of the GBS toxin receptor is an isolated antibody or a fragment thereof. Applicants assert that application as filed enables one of ordinary skill in the art in the field of the present application to make and use antibodies for detection of a GBS toxin receptor. For example, working Examples 4 and 5 on pages 45-47 of the specification teach detection of a GBS toxin receptor by rabbit polyclonal antibodies.

In view of the foregoing, applicants respectfully submit that the claim amendments overcome the rejection under 35 U.S.C. §112, first paragraph, for reasons of insufficient enablement. The application, as filed, enables one of ordinary skill in the art in the field of the claimed invention to make and use the compositions as claimed in the currently amended claims. Therefore, applicants request withdrawal of the rejection.

Claim Rejections under 35 U.S.C. §112, First Paragraph - Written Description

The Examiner rejects Claims 82, 83, 85-89, 97-100, 102 and 103-105 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Applicants have canceled Claims 83, 98 and 100, rendering their rejection moot. Applicants assert that the amendments to Claims 82, 87, 89, 97, 99, 102 and 104 overcome the rejection.

Amended Claims Recite Antibodies or Fragments Thereof Recognizing GBS Toxin Receptor

The Examiner asserts that the application, as filed, does not support the scope of the genus of GBS toxin receptors and fragments thereof encompassed in the claims. See *Final Office Action*, page 6, second paragraph. The currently amended claims are directed to antibodies recognizing GBS toxin receptor and compositions comprising such antibodies. Examples of the description of the antibodies in the specification are provided on page 25, line 2,

through page 26, line 20, and in working Examples 4 and 5 on pages 45-47. Applicants assert that the application, as filed, describes antibodies for detection of a GBS toxin receptor in such a way as to reasonably convey to one skilled in the art in the field of the present application that the inventors, at the time the application was filed, had possession of the claimed invention.

The Examiner asserts that the application, as filed, does not provide an adequate description of Claim 97, directed to a reagent for detection of a GBS toxin receptor or a fragment thereof. See *Final Office Action*, page 5, second paragraph.

Upon entry of the present amendments, Claim 97 and its dependent claims will specify that the reagent for detection of the GBS toxin receptor is an isolated antibody or a fragment thereof. Applicants assert that application as filed describes antibodies or fragments thereof for detection of a GBS toxin receptor in such a way as to reasonably convey to one skilled in the art in the field of the present application that the inventors, at the time the application was filed, had possession of the claimed invention. For example, working Examples 4 and 5 on pages 45-47 of the specification teach detection of a GBS toxin receptor by rabbit polyclonal antibodies.

Application Provides Adequate Written Description for a Genus of GBS Toxin Receptors With 86% identify to SEQ ID NO:8

The Examiner asserts that the application, as filed, does not provide adequate written description for a genus of GBS toxin receptors with 86% identify to SEQ ID NO:8. Applicants disagree. Applicants bring to the Examiner attention that the parent application (now issued as U.S. Patent No. 6,803,448), was found to provide adequate written description for a genus of GBS toxin receptors having 86% identity. Applicants have attached U.S. Patent No. 6,803,448 as Exhibit A for the Examiner's convenience.

In addition, applicants submit that the application as filed, in combination with knowledge available to one of ordinary skill in the art in the field of the present application, describes a genus of GBS toxin receptors with 86% identify to SEQ ID NO:8 in such a way as to reasonably convey to one skilled in the art in the field of the present application that the

inventors, at the time the application was filed, had possession of the claimed invention. It is commonly accepted by those of skill in the art in the field of biological sciences that proteins that share significant sequence similarity can be expected to share significantly similar functions. In addition, it is recognized by those of skill in the art that many mutations have absolutely no effect on the function of a protein.

For example, page 341 of *Genomes* (by T.A. Brown, ©1999, John Wiley and Sons, New York; attached as Exhibit B) states:

> The protein coded by the mutated gene therefore has a single amino acid change, which often has no significant effect on the biological activity of the protein: most proteins can tolerate at least a few amino acid changes without noticeable effect on the ability to function in the cell...

The ability of proteins to tolerate amino acid changes has been well known in the art for many years. For example, see Reidhaar-Olson and Sauer, "Combinatorial cassette mutagenesis as a probe of the informational content of protein sequences," *Science* 241:53-7 (1988) (Attached as Exhibit C). Sauer and Reidhaar-Olson demonstrate that many positions in a protein can tolerate a wide variety of alternate amino acids without affecting function. Thus, at the time of filing of the present application, one of ordinary skill in the art in the field of the application, could reasonably expect two proteins with at least 86% sequence identity to share the same function.

Additionally, the specification describes which substitutions to make and where to make them. For example, at page 20, lines 14-20, the specification teaches particular amino acid residues at which a substitution is preferably made. At page 20, lines 21-25, the specification teaches that the particular substitutions are preferably those which replace an amino acid with a different amino acid from the corresponding residue in the disclosed human or sheep sequences. At page 20, lines 25-27, the specification teaches that the preferred amino acid substitutions are those that confer certain properties to the altered protein. At page 21, line 22 to page 22, line 3, the specification teaches what particular regions of the protein should be avoided in making substitutions. Therefore, applicants assert that the application, as filed, describes a genus of GBS

toxin receptors with 86% identify to SEQ ID NO:8 in such a way as to reasonably convey to one skilled in the art in the field of the present application that the inventors, at the time the application was filed, had possession of the genus. Accordingly, applicants respectfully request that the Examiner withdraw the rejection.

Application Provides Sufficient Written Description for Antibodies or Fragments Thereof that Bind GBS Toxin Receptors with 86% Sequence Identity to SEQ ID NO:8

Moreover, applicants assert that the application provides sufficient written description for the claimed composition, a genus of antibodies or fragments thereof that bind GBS toxin receptors having 86% sequence identity to SEQ ID NO:8. It is well known to those of ordinary skill in the art in the field of biological sciences that an antibody may recognize proteins with different sequences. In the application, as filed, applicants provided a written description of how to identify antigenic sequences within the GBS toxin sequence and use them to design immunogenic peptides in order to generate anti-GBS antibodies. See, *for example*, *Specification*, p. 25, lines 19-30, p. 44, line 20, through p. 45, line 6. Applicants also describe how to use these generated antibodies to detect GBS toxin receptor in both mouse and human tissues. See *Specification,* p. 45, line 8, through p. 47, line 15. Accordingly, applicants assert that the application, as filed, describes antibodies or fragments thereof that recognize a genus of GBS toxin receptors with 86% identify to SEQ ID NO:8 in such a way as to reasonably convey to one skilled in the art in the field of the present application that the inventors, at the time the application was filed, had possession of the claimed invention. Therefore, applicants respectfully request that the Examiner withdraw the rejection.

Support for Claim 105 is Found in the Application as Filed

The Examiner rejects Claim 105, stating that applicants failed to point out support in the specification for previously presented Claim 105, directed to an isolated antibody. See *Final Office Action*, p. 7, first paragraph. Applicants bring to the Examiner's attention that Claim 105 is directed to an isolated composition comprising an antibody. Applicants assert that support for Claim 105 is found throughout the specification, as filed. For example, blood

isolated from rabbits and comprising anti-GBS antibodies is described on p. 44, line 20, through p. 45, line 6. A manual describing antibody production is incorporated by reference in the specification on p. 25, lines 6-8. Accordingly, applicants respectfully request that the Examiner withdraw the rejection of Claim 105.

In view of the claim amendments and the foregoing arguments, applicants request withdrawal of the rejection under 35 U.S.C. §112, first paragraph, for reasons of insufficient written description.

Claim Rejections under 35 U.S.C. §112, Second Paragraph

The Examiner maintains the rejection of Claim 97 under 35 U.S.C. §112, second paragraph, as indefinite on the basis that the specification fails to recites the term "a reagent" unambiguously. Applicants assert that the present amendments overcome the rejection.

Upon entry of the present amendments, Claim 97 and its dependent claims will specify that the reagent for detection of the GBS toxin receptor is an isolated antibody or a fragment thereof. In view of the foregoing, applicants assert that Claim 97 and its dependent claims are definite and request withdrawal of the rejection under 35 U.S.C. §112, second paragraph.

CONCLUSION

The foregoing is submitted as a complete Response to the Final Office Action mailed January 31, 2007. Applicants submit that the claims in the present application are in condition for allowance, and such action is courteously solicited. No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 11-0855. If the Examiner believes that any informalities remain in the case, which may be corrected by Examiner's amendment, or that there are any other issues which can be resolved by a telephone interview, a telephone call to the undersigned agent at (404) 815-6102 is respectfully solicited.

Respectfully submitted,

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